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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,048	12/14/2005	Shinji Nishimac	08917-109US1 F 04-038-PCT	3964
26161	7590	11/13/2007	EXAMINER	
FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			LISTVOYB, GREGORY	
			ART UNIT	PAPER NUMBER
			1796	
			MAIL DATE	DELIVERY MODE
			11/13/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/561,048

Applicant(s)

NISHIMAE ET AL.

Examiner

Gregory Listvoyb

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 3/15/2006.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

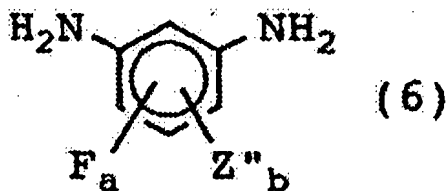
### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12 rejected under 35 U.S.C. 103(a) as being unpatentable over Masayoshi et al (EP 1275679, enclosed with Application examined) herein Masayoshi in combination with Hazen et al (US 5011997) herein Hazen or Andrews et al ("Proton magnetic resonance spectra of some 2-substituted 1,3 phenylenediamines and their N, N'diacyl derivatives, Aust.J. Chem, 1971, pp.413-422, enclosed with Application examined) herein Andrews.

Masayoshi discloses a fluorinated phenylenediamine of the following formula (6) (see page 11, line 031):



where Z'' denotes a chlorine, bromine, or iodine atom, preferably a chlorine atom or a bromine atom, and most preferably a chlorine atom, a denotes the number of

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fluorine atoms bonded to a benzene ring, representing an integer of 0 - 4, preferably 0, 3, or 4, and b denotes the number of "Z" "bonded to a benzene ring, representing 0 - 4, preferably 0, 1, or 4. In the preceding formula, when "Z'" is present plurally (namely, b denotes an integer of 2 - 4) in a benzene ring, each Z' may be same or different. In the foregoing formula, the total of a and b ought to be invariably 4 (namely,  $a + b = 4$ ).

The above formula (6) is identical to one of Claim 1 of the Application examined and used for the same purposes of polyimide synthesis.

Regarding Claims 2 and 7, Masayoshi teaches 1,3-diamino-2,4,5,6-tetrafluorobenzene, and 5-chloro-1,3-diamino-2,4,6-trifluorobenzene (see page 11, line 031), which are identical to diamine of the above Claim.

In reference to Claims 5-7, 11, 12 Masayoshi teaches a method of making of a polyamic acid and a polyimide based on the above diamine, where tetracarboxylic acid dianhydride is based on variety of divalent organic radicals (see page 12, line 033) at the presence of organic solvent (see page 12, line 35).

Masayoshi does not teach a method for the production of a fluorinated aromatic diamine from corresponding diamide.

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Hazen discloses a method for the production of a fluorinated aromatic diamine (see Column 2, line 45) which comprises steps of reacting a diamide with NaOCl (Sodium Hypochlorite, see Column 3, line 10) at a molar ratio of the NaOCl to the diamide (NaOX/diamide ratio) in the range of 2.1 – 2.2 (see Column 4, line 25) and NaOH (see Example 1).

Note that in Hazen process a molar ratio of the NaOH to the diamide (NaOH/diamide ratio) is higher than 6.0. This is an Examiner's position that NaOH role in Hoffmann rearrangement process (the same method used by both Hazen and the Application examined) is to create certain pH. Since Hazen's diamine has much higher molecular weight compare to one in the application, the molar ratio of the NaOH to the diamide (NaOH/diamide ratio) is higher than 6.0 at the same pH range.

Andrews discloses preparation of Isophthalic-based diamine from corresponding diamines with Hoffmann rearrangement. He teaches that the NaOH to the diamide (NaOH/diamide ratio) is 6.0 (see page 416).

Therefore, it would have been obvious to a person of ordinary skills in the art to use such a NaOH/diamide ratio, which provides an effective Hoffmann rearrangement process.

Hazen teaches that the above Hoffmann rearrangement process results in a product of high purity (more than 95%) and high yield (see Column 5, line 15), which is

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much higher compare to ones of traditional methods (yield is within the range of 26-42%, see Column 1, line 20). It makes this process very attractive for production of raw materials for polyimides.

Therefore, it would have been obvious to a person of ordinary skills in the art to use Hoffmann rearrangement method disclosed by Hazen or Andrews for production of high purity diamines. It makes the process of the following manufacture of polyimides more economical and resulting polymers with better properties.

Regarding Claims 4 and 8-10, fluorinated phenylenediamines which are produced with Hazen or Andrews's method would be expected to have molar absorbtion coefficient at 450 nm of not more than 2.5l/mol cm, due to their high purity.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory Listvoyb whose telephone number is (571) 272-6105. The examiner can normally be reached on 10am-7pm.

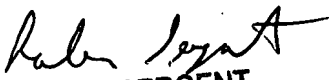
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Gregory Listvoyb  
Examiner  
Art Unit 1796

GL  
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RABON SERGENT  
PRIMARY EXAMINER